

REMARKS

Applicant thanks Examiner Erick Rekstad and Supervisory Examiner Chris Kelley for providing the opportunity of a telephone interview conducted on May 4, 2004. During the interview Applicant's representative explained that the cited references do not disclose determining an interval between successive frames of the predictive coded picture according to the time-varying rate of the magnitude of motion. However, the Examiners alleged that Hatano discloses adjusting an M value within a GOP based on a time varying rate (S_a of Equation F21, Hatano, col. 35, line 20), and a magnitude of motion (S_b of Equation F22 of Hatano, col. 35, line 26). This allegation by the Examiners was based on their reading of the claim language "time-varying rate of the magnitude of motion" understood as a speed (time-varying rate) of the motion.

No agreement was reached. Near the conclusion of the interview, the Examiners invited the submission of a written response to the Office Action. The foregoing will serve as Applicant's statement of the substance of the interview.

Claims 1-7, 9-16 and 18 are the claims still pending in the present Application.

Independent claims 1, 4 and 12 are amended to clarify features recited thereby. These clarifications of wording are not believed to necessitate new searching by the Examiner, and therefore these amendments should now be entered into the record.

Formal Matters

Applicant notes that the claim for foreign priority and the receipt of the priority document have not been acknowledged. Applicant respectfully requests that the Examiner so acknowledge the same in the next Office correspondence.

Applicant thanks the Examiner for reviewing and considering the references cited in the Information Disclosure Statement filed February 6, 2003.

However, Applicant notes that the Examiner has not acknowledged review and consideration of the reference cited in the Information Disclosure Statement filed August 18, 2000. The Examiner is respectfully requested to so acknowledge in the next Office correspondence.

Rejection of Claims 1, 2, 12 and 14 under 35 U.S.C. § 103

Claims 1, 2, 12 and 14 under 35 U.S.C. § 103, as being obvious from Suzuki, U.S. Patent No. 5,883,672 and Hatano, U.S. Patent No. 6,091,460. This rejection is traversed.

Among the problems recognized and solved by Applicant's claimed invention is that the use of the magnitude of motion of input frames in video compression encoding system is not always sufficient by itself for efficient setting of the M-value (the interval between successive P-pictures).¹ According to an aspect of Applicant's claimed

¹ The present discussion highlights aspects of Applicant's claimed invention. However, Applicant does not represent that every embodiment of Applicant's claimed invention

invention, the time-varying rate of the magnitude of motion, such as for example a rate of change of an average motion vector, is used to determine the M-value. In this way the encoding system may determine an appropriate frame interval even if the magnitude of motion shrinks abruptly due to a fast moving picture. For example, as described in the Applicant's disclosure, page 16, when the average motion vector decreases sharply, an optimum value of the frame interval M can be obtained for the fast moving pictures. The time varying-rate of change may be calculated as the rate of change of the average motion vector (magnitude of motion) as described in the Disclosure, page 15. Also, as illustrated in Fig. 8, the time varying-rate of change may be a slope (change in x/change in y) of the magnitude of motion.

For at least the following reasons, Applicant's claimed invention is neither anticipated by, nor obvious from the cited prior art. By way of example, independent claims 1 and 12 require determining an interval between successive frames of the predictive coded picture according to the time-varying rate of change of the magnitude of motion.

Suzuki discloses an apparatus and method for adaptively encoding pictures in accordance with the information quantity of pictures and inter-picture correlation. Suzuki discloses the detection of a scene change for determining when to perform intra-frame coding (I pictures). Suzuki discloses that scene change detection is carried out using the parameter AD or the parameter SAD, which is the sum of the AD

necessarily solves the problems herein identified or provides the solutions discussed herein as illustrative examples.

parameter for the full picture; and, that scene change is detected based upon the rate of change of the parameter SAD.

The Examiner acknowledges that Suzuki does not teach determining an interval between successive frames of the predictive coding picture, and does not teach the method of adjusting the GOP size. However the Examiner alleges that Hatano discloses these features. Hatano discloses a video signal and coding method and system that uses inter-frame prediction error to determine the speed of motion (Hatano, col. 35, lines 1-43) and determines the number of B-picture frames to be inserted depending on the speed of motion. The detected speed of motion is used to determine whether or not B pictures are selected to control the interval between successive P pictures. If quick motion is detected, B pictures are not used and the motion compensation is performed using the one-way prediction only (Hatano, col. 35, lines 58-67).

Hatano does not disclose or suggest determining an interval between successive frames of the predictive code of picture according to the time-varying rate of the magnitude of motion. Therefore, Suzuki and Hatano, even if taken together as a whole, do not disclose or suggest Applicants' invention as claimed in independent claims 1 and 12.

During the interview, the Examiners cited Hatano, col. 35, lines 20-26 and alleged that Hatano, Equation F21, corresponds to a time varying rate and that Equation F22 corresponds to a magnitude of motion.

Applicant submits that the value S_a of the cited passage of Hatano represents a total sum of the time-varying rate of pixel luminance, not of a motion vector. More particularly, the cited passage describes that the difference in luminance at each

pixel point (i, j) between the current and the previous picture is detected, and then integrated over the full picture area. That is, the value S_a , if it exceeds some critical value, represents a scene change. Motion estimation does not work in the case of scene changes (or splicing) because the information from one picture to the next picture changes completely at the splice. In addition, the variance value S_b , Equation F22, is a statistical value of luminance. It does not represent a magnitude of motion.

Claim 2 depends from independent claim 1, and claim 14 depends from independent claim 12. Therefore, claims 2 and 14 incorporate novel and non-obvious features of independent claims 1 and 12, and are patentably distinguishable over the prior art for at least the reasons that independent claims 1 and 12 patentably distinguishable over the prior art.

Rejection of Claim 3 under 35 U.S.C. § 103

Claim 3 is rejected under 35 U.S.C. § 103 as being obvious from Suzuki and Hatano in view of Sugano, U.S. Patent No. 6,473,459. This rejection is traversed.

Claim 3 depends from independent claim 1 and therefore incorporates the novel and non-obvious features thereof. Sugano does not remedy the deficiencies of Suzuki and Hatano as they relate to Applicant's invention as claimed in independent claim 1. Sugano discloses a scene change detector in which a motion vector calculating unit for accumulating reconstructive motion vectors in averaging the vectors for areas used in the detection of scene change (Sugano, col. 4, lines 44-60; col. 5, lines 26-45; Fig.

2). Sugano discloses that a mean value of a motion vector is calculated to determine the frame interval (Sugano col. 5, lines 36-40; col. 7, line 31-43).

Sugano does not disclose or suggest determining an interval between successive frames of the predictive coded picture according to the time-varying rate of the magnitude of motion, as required by independent claim 1. Accordingly, claim 3 is patentably distinguishable over the prior art for at least the reasons that independent claim 1 is patentably distinguishable over the prior art.

Rejection of Claims 13, 15, 16 and 18 under 35 U.S.C. § 103

Claims 13, 15, 16 and 18 are rejected under 35 U.S.C. § 103 as being obvious from Suzuki, Hatano and Sugano in view of Lee et al., U.S. Patent No. 5,565, 920. This rejection is traversed.

Claims 13, 15, 16 and 18 depend from independent claim 12, and therefore incorporate the novel and non-obvious features thereof. Lee does not remedy the deficiencies of Suzuki and Hatano as they relate to Applicant's invention as claimed in independent claim 12.

Lee does not disclose or suggest determining an interval between successive frames of the predictive coded picture according to the time-varying rate of the magnitude of motion, as required by independent claim 12. Accordingly, claims 13, 15, 16 and 18 are patentably distinguishable over the prior art for at least the reasons that independent claim 12 is patentably distinguishable over the prior art.

Claim 4-7 and 9-11 are rejected under 35 U.S. C. § 103

Claim 4-7 and 9-11 are rejected under 35 U.S. C. § 103 as being obvious from Hatano, Sugano and Lee. This rejection is traversed.

Independent claim 4 requires determining an interval between successive frames of the predictive coded picture according to the time-varying rate of change of the value. As discussed, Hatano, Sugano, and Lee do not disclose or suggest this feature.

Claims 4-7 and 9-11 depend from independent claim 4 and thus incorporate the novel and nonobvious features thereof. Therefore, claims 4-7 and 9-11 are patentably distinguishable over the prior art for at least the reasons that independent claim 4 is patentably distinguishable over the prior art.

For at least the reasons set forth in the foregoing discussion, Applicant believes that the Application is now allowable and respectfully requests that the Examiner reconsider the rejections and allow the Application. Should the Examiner have any questions regarding the Amendment or the Application generally, the Examiner is invited to telephone the undersigned attorney.

Respectfully submitted,



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